Theory and evidence of municipal borrowing in Chile

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Abstract Although Chilean municipalities are not permitted to borrow, they do so through arrears and leasing contracts. A formal model of municipal indebtedness is estimated, based on a sample of 345 municipalities with yearly data from 2004 to 2007. Variables that are positively and significantly related to borrowing through arrears are: mayors closely tied to the ruling central government coalition; politically diverse municipal councils; years close to elections; and deeper municipal involvement in education. While leasing contracts appear to be insensitive to political factors, they are positively and significantly related to municipal staff managerial skills and municipal revenues per capita.

Keywords Debt · Local governments

JEL Classification H72 · H74

1 Introduction

Government borrowing may be justified on two grounds. First, by spreading out the cost of new capital goods, it provides a way to enhance intergenerational equity. Since most public investment does not benefit only current taxpayers, there is an element of fairness in placing part of the burden of public capital financing on future generations. Second, borrowing makes it feasible for governments experiencing deficits to bridge the gap between current revenues and necessary expenditures without having to raise taxes above their optimal level. As long as deficits are transitory phenomena, access to credit smoothes the expenditure path over time and in so doing improves government performance.

While the existing empirical literature has usually stressed the similarities between the standard portfolio theory of private firms and the funding structure of local governments, a number of specific features must be considered when dealing with sub-national borrowing. The first one hinges upon the fact that in most cases, debt-funded expenditure is not a freely

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determined option at lower tiers of government as it is often subject to numerous restrictions. Second, the potential for moral hazard derived from an implicit central government guarantee on sub-national debt is two-fold. On the one hand, the potential for bailout by the central (federal) government may lead to excess borrowing. On the other hand, this is likely to make private credit suppliers less selective in lending to sub-national governments. Another difference when compared to financing private companies is the importance of political economy considerations and opportunistic behavior. In such a framework, by shifting tax liabilities to future generations, government borrowing blunts opposition to spending initiatives by current taxpayers, who do not therefore bear the full cost of government—a form of "fiscal illusion".

This paper explores the determinants of sub-national debt in Chile. Although Chilean municipalities are not legally allowed to borrow, they do it in practice. This is done through leasing contracts, which in this case could be considered a long term source of debt, and a wide variety of unpaid bills. Of the municipal arrears, two are the specific subjects of this research. One is the delay in paying social security contributions on behalf of municipal employees. In Chile, employers are responsible for transferring pension fund and health care contributions to private pension administrators, private health insurance companies and the public health system. Nevertheless, municipalities often procrastinate in making payments. Another type of debt worth examining is unpaid contributions to the so-called Common Municipal Fund, which is intended to redistribute tax revenues across municipalities. All municipal governments are required by law to transfer a share of the taxes they collect to this fund. Similar to arrears in social security contributions, delays in these transfers are often used to compensate for short-term imbalances between revenues and expenditures.

An empirical model of borrowing behavior which combines political and economic factors is tested for the aforementioned borrowing sources by using annual data from 2004 to 2007. An examination of political variables shows that mayors who are politically close to the central government coalition currently in power borrow more through arrears; however, this is not a significant variable for leasing contracts. Likewise, politically diverse municipal councils tend to be more likely to engage in such borrowing, particularly in years close to elections. The funds obtained by such means appear to be closely related to teacher payroll expenditures. As far as leasing operations are concerned, the main finding highlights the significant role played by the mayor's salary grade, which suggests a close link between mayoral and municipal staff expertise and municipal performance. Finally, municipal revenues per capita and the municipality's population also have a positive affect on the demand for leasing.

The remainder of this paper is organized as follows. Section 2 discusses the theoretical context in which the issue at stake is being addressed. Section 2 presents the theoretical debate. Section 3 describes the Chilean institutional context. A description of the data is provided in Sect. 4. Section 5 presents the empirical model. Estimation results are shown in Sect. 6. Section 7 summarizes the main conclusions.

2 The debate about borrowing

2.1 Why sub-national governments borrowing may exceed what is socially optimal

The so-called capital structure of private firms refers to the mix of equity and debt. In government financing, equity must be replaced by taxes and/or grants at the sub-national level. However, there is another more fundamental difference. Whereas the holder of a bond issued

by a private firm can clearly identify who is responsible for servicing and retiring it, the incumbent government is perceived as only partially accountable for existing public debt. The fact that costs related to budgetary decisions are often not fully internalized by the political coalition or party in office, in addition to the well-known *common pool* problem (Weingast et al. 1981), may lead taxpayers to support sub optimal political options. The existing literature on the subject recognizes that the "equilibrium approach" to government budget deficits—which has been well synthesized by Barro (1979)—is generally insufficient for capturing the entire range of factors that affect public debt.

As we move down by level of government, another problem arises. This results from the ability of higher levels of government to provide an implicit guarantee on sub-national government debt. This is a classical *moral hazard* situation, whereby borrowers are likely to over borrow and creditors are likely to over lend in response to this unwritten official insurance. The question is whether such a risk can be successfully controlled by some kind of rule, or if the credit market can do the job on its own. Empirical support for the hypothesis that institutional constraints limit government spending is not fully conclusive. While cross country evidence shows that the effectiveness of institutional constraints heavily depends on the type of control being imposed and a number of idiosyncrasies of the country in question (Plekhanov and Singh 2006), there is mixed evidence from country-level studies conducted in the United States and Europe. For other sources of debt finance in the United States, Abrams and Dougan (1986) conclude that restrictions on borrowing and spending are not significant in explaining state budget outcomes. The French case appears to suggest that macroeconomic policy measures emanating from the central government do affect local government borrowing decisions (Derycke and Gilbert 1985). Less conclusive results were obtained by Kenyon (1991) on the effects of caps on federal and local tax-exempt bond issues in the United States. While caps were shown to be effective in reducing the volume of borrowing, they do not appear to have a significant impact on whether sub-national governments substitute tax-exempt bonds for other sources of borrowing. Further confirmation that institutional restrictions do matter can be found in Alt and Lowry (1994), who examine the effectiveness of state-level fiscal control in the United States. Their empirical results suggest that divided party governance matters when it comes to responding to exogenous shocks. Interestingly, they also find significant differences between Democrats and Republicans when it comes to fiscally relevant decisions. Although more cautious in arriving at general conclusions, Poterba (1995) provides further confirmation of the role of fiscal rules in the United States. The opposite result can be found in a study of Spain by Cabasés et al. (2007). This provides evidence that municipalities are sensitive to institutional restrictions on their decisions to borrow. On the one hand, borrowing appears to be used mainly for investment as established by the law. On the other hand, restrictions on short-term and emergency borrowing based upon a maximum percentage of the previous year's revenues significantly affect levels of current-year indebtedness. The type of municipality and the level of local co-funding also matter as far as municipal borrowing is concerned.

2.2 The political economy of government borrowing

One strand of literature stresses the potential for strategic behavior on the part of policy makers. This may occur as a result of the ruling coalition or party having a probability lower than one of being in office at the time the current debt is to come due. This generates a strong incentive for the incumbent to overspend (Buchanan 1997) and/or behave strategically (Persson and Svensson 1989; Alesina and Tabellini 1990; Aghion and Bolton 1990).

Another vein of discussion focuses on the degree of government fragmentation and the coordination costs of controlling public debt. It has been argued that the larger the number of political actors in government (Alesina and Drazen 1991) and/or veto players in a coalition (Howitt and Wintrobe 1995; Tsebelis 1995, 1999), the more likely it is that a large deficit will remain over time. Two seminal papers by Roubini and Sachs (1989a, 1989b) have put forward the so-called "*weak government hypothesis*" which states that governments characterized by short tenure and representative of a large coalition tend to produce larger deficits. While Roubini and Sachs provide evidence for this hypothesis from a sample of OECD countries, Ashworth et al. (2005) find similar results for Belgian municipalities. They show that an increase in the number of political parties as well as in the size of the coalition government does lead to more borrowing. Nevertheless, this effect is significant in the short term but not in the long term. Contrary results are found by Volkerink and Haan (2001), who report that political fragmentation has no effect on government budget deficit in a panel of OECD countries. Along the same lines, Freitag and Vatter (2008) find no systematic relationship between political fragmentation and Swiss cantons' debt. By using alternative definitions of fragmentation, Haan et al. (1999) conclude that coalition governments are not necessarily more likely to run larger deficits. Instead, it is the number of parties in the coalition that really matters. Ricciuti (2004) shows that "size fragmentation", defined as the number of spending ministries in the cabinet—as opposed to political fragmentation within the ruling coalition—is a systematically significant variable for explaining deficits. While other definitions appear to have limited or conditional effects on deficits, Ricciuti finds no evidence that government turnover ("over time fragmentation") is a significant variable. Similar results are presented by Perotti and Kontopoulos (2002) and Schaltegger and Feld (2009) for Swiss cantons.

Regarding the effect of a government's political orientation on fiscal behavior, most evidence supports the view that leftist and center-left coalitions are more spending oriented than conservative ones (Crain 2001). Whereas Hibbs (1977) shows that leftist and center-left coalitions tend to produce lower unemployment and higher inflation in a sample of western European and American nations, Volkerink and Haan (2001) conclude that right-wing governments are more fiscally responsible. Similar conclusions can be found in Alesina and Tabellini (1990). A contrary theoretical result is presented by Persson and Svensson (1989). Their model contends that a "stubborn" conservative government which is likely to be succeeded by a liberal one will be tempted to borrow more and tax less in order to diminish the fiscal leeway of the successor. Empirical support for this hypothesis can be found in Petterson-Lidbom (2001) for a sample of Swedish municipalities.

A number of other debt-related variables have been tested in this regard. Most empirical studies control for the jurisdiction's income to evaluate its effect on the demand for local public goods and therefore on borrowing (see Ashworth et al. 2005); the share of total revenues which are comprised of grants; as well as the effect of fiscal capacity. Lewis (2003) provides evidence that although fiscal capacity is a significant variable for explaining borrowing, this same variable does not have a similar effect on local governments' willingness to repay local debt.

3 The institutional context

Two general systems that frame access to credit by sub-national governments can be distinguished (Martell 2003). One is the so-called relationship-based system, whereby borrowers are regulated by a set of norms intended to "protect" them from default. It can be said that

developing countries with immature capital markets operate closer to this model. Alternatively, in the "market-based" system, the market penalizes irresponsible financial management and excess borrowing. While no clear-cut groups of countries of each type can be identified, there is an intellectually relevant distinction between the United States-Canada and Europe. Although there are diverse situations within both the United States and Canada, sub-national governments in those countries generally have access to the capital market in a context of relatively broad and market-friendly regulations. Despite western European countries increasingly moving toward the US-Canadian model, their debt markets are generally more regulated and the use of explicit constraints on borrowing is still a common practice (Swianiewicz 2004). The prevalence of protective rules is certainly evident in Latin America as well, where access to credit is still limited for small, private companies and local government jurisdictions. While countries with federal structures like Mexico, Argentina and Brazil are more developed in this respect, unitary countries in the region exhibit a wide range of explicit regulations on sub-national borrowing.

Among countries in the region, Chile is certainly at one end of the spectrum. Because the permitted functions of the Chilean public sector are governed by the *ultra vires* doctrine,[1] the absence of any reference to sub-national borrowing in the law means that such a funding mechanism is ruled out. However, in practice municipalities do borrow. One credit source is delay in paying ongoing, short-term liabilities to providers of local goods and services, of which this research will look specifically at social security contributions on behalf of municipal employees. This particular source of indebtedness is closely related to the size of the municipal contribution to education. Chilean public schools are administered by municipalities and funded through a voucher per student provided to local governments by the Ministry of Education (Letelier 2008). Because in most cases such transfers from the central government are insufficient to cover all expenses, municipalities which make relatively larger contributions to close the education budget deficit are also more likely to postpone teachers' regular social security payments.

A second common type of arrears to be examined is the one originating from delays in payments to the Common Municipal Fund (CMF),[2] which redistributes tax revenues from wealthy to poor municipalities. Until December 2007, municipalities in arrears were given the chance to a contract with the Office of the Undersecretary for Regional Development (SUBDERE) whereby outstanding debts to this fund could be paid over an agreed-upon period. Since then, a new law in effect establishes that such debt must be paid over the six months following the municipality's notification of its required annual contribution. Once this deadline passes, the Treasury Inspector's Office discounts the corresponding amount from other regular payments to the municipality.

The third borrowing channel deserves separate mention. This consists of leasing and leaseback operations that municipalities can undertake under specified conditions. According to Article 9 of the Public Sector Law, municipalities may engage in these kinds of contracts as long as they do not maintain debts of the type mentioned above and have no current deficit. With formal approval from the municipal council, they may request permission from the Ministry of Finance to sign a lease contract. Although this is subject to the specific financial conditions of the municipality requesting the leasing option, the law signals that

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[1] Only those functions and attributions which are explicitly stated in the law are permitted.

[2] All municipalities must contribute 60% of property taxes collected from private property owners, 100% of property taxes paid on publicly owned property, 62.5% of vehicle registration revenue, 50% of vehicle transfer taxes and 100% of fines for traffic violations. The three wealthiest municipalities in Chile (Las Condes, Providencia and Vitacura) are subject to even larger contribution requirements.

"equipment" leases must be paid within the incumbent mayor's term. In the case of real estate acquisitions, payment must be made within five to 10 years.

A fourth source of debt originates from loans provided by the Inter-American Development Bank to the central government, which then transfers such funds to the municipalities. Local governments receiving these funds register this operation as "internal public debt" and account for it as debt to the central government. This is a purely deterministic source of indebtedness, as it is the central government that decides the amounts to be borrowed, the projects to be funded and the specific municipalities to be given the loans. Other traditional sources of municipal funding such as local taxes and grants are also limited and rather inflexible in Chile. With very few exceptions, tax rates are determined for the most part by federal law for all municipalities. Regarding grants, the most important one is the aforementioned payout from the Common Municipal Fund. Along with transfers to support education and primary health care—which may be used solely for their intended purpose—Chilean municipal governments may apply for other public funds on a competitive basis.

Regarding the local political structure, democratic municipal elections were restored only in 1992. Nevertheless, until 2004, the local constituency chose only the composition of the municipal council, which then appointed the mayor from among its members. From that year onward, both the municipal council and the mayor are elected directly by local voters once every four years.[3] Among other functions, the municipal council oversees the mayor's decisions and its approval is required for a wide range of municipal government initiatives, which include the signing of contracts in amounts higher than 500 UT.[4] Since most leasing operations usually involve amounts above that figure, council approval is needed.

The current political scenario in Chile is dominated by two competing coalitions. The first is the "*Concertación por la Democracia*" (Pro-Democracy Coalition), commonly referred to as the *Concertación*. This coalition has maintained control of the central government since 1989 and is comprised of four political parties: the Christian Democrats (Democracia Cristiana, or DC), the Socialist Party (Partido Socialista, or PS), the Pro-Democracy Party (Partido por la Democracia, or PPD) and the Radical Social Democrats (Partido Radical Social Demócrata, or PRSD). Both the DC and PS may be classified as doctrine-based parties. While the DC is inspired by the social dogmas of the Catholic Church, the PS is a secular, socially oriented party. The PPD was born in the wake of the military government as an attempt to gather a wide range of political forces whose common *leit motiv* was the struggle for democracy. Although the PPD is very often identified as a liberal party, it does not in fact have a clear-cut doctrine of its own. The PRSD is the smallest Concertación party and claims to be a bulwark of classical social democratic principles.

The opposition is made up of two politically distinct coalitions. One is the "*Alianza por la Democracia*" (Pro-Democracy Alliance) which is commonly identified as a center-right coalition, made up of the Independent Democratic Union (Unión Demócrata Independiente, or UDI), and the National Renovation party (Renovación Nacional, or RN). While the UDI is a clearly doctrinaire party in its pro "subsidiary state" view of the economy and a conservative approach to social issues, the RN claims to be liberal both in economic and social terms. Since democracy was restored in 1989, this has been a relevant political distinction. The other opposition bloc is a far-left coalition known as *Juntos Podemos Más* (Together We Can Do More). Currently, only eight of the 345 municipalities in Chile have a mayor belonging to this coalition.

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[3]A military government ruled the country between 1973 and 1989.

[4]UT stands for "*Unidad Tributaria*" (Taxing Unit). 500 UT is equivalent to approximately US$ 36,150.

Although Chile is fiscally centralized in comparison to similar countries in Latin America and elsewhere, the current political debate does not consider the possibility of greater municipal autonomy as far as borrowing is concerned. There are two likely reasons for this. One is the internationally recognized, solid performance of the Chilean economy, which combines the balancing of public budget with various achievements in terms of important social and economic indicators. Thus, there is great concern about the potential effects of any reform leading to a loss of financial control on the general government budget. Second, although Chile is one of the very few countries in which local borrowing is not permitted, the highly political centralization of the legal approval process makes it unlikely that such reforms will be considered. Also, it is the central government which defines the current legislative agenda and establishes priorities.

4 Data

To set the problem within the municipal budget context, the sources of funding for current expenditures (C^E) and capital expenditures (K^E) can be summarized as follows:

$$C^E + K^E = C^R + K^R + CMF + AF + B \tag{1}$$

Based on (1), total expenditures must be funded by current revenues (C^R), which include municipal taxes and local user fees, capital revenues (K^R) from municipally owned real estate, the net benefit from the CMF, applicable funds (AF) other than the CMF and borrowing (B). As stated above, the CMF is a variable that is fully exogenous to the municipality. Current revenues (C^R) depend primarily on the municipality's effort to update the local property cadastre[5] and the extent to which vehicle owners obtain their new registrations from the municipality in question (vehicle owners may register their vehicles in any municipality). Since cadastres are undertaken only once every four years and municipal campaigns to promote local vehicle registration are largely ineffective, regular municipal revenues are quite rigid in the short term. Nevertheless, local governments may apply for specific investment funds (AF) which are assigned by the central government on a competitive basis. Formally, these funds are not considered part of the municipal budget approved by the local council.[6] Capital revenues are a negligible part of municipal revenues in Chile and may also be considered exogenous.

As stated previously, short-term borrowing appears in the form of arrears (ARS) and is recorded as two separate types of debt. One type is the so-called "budgeted debt" ($D.B$), which includes a myriad of budget-recorded unpaid bills, and the other is "non-budgeted debt" ($D.NB$) (2). The latter debt is not considered a formal budget liability, although it does generate an accounting obligation. This is what occurs with unpaid social security contributions and other legal payroll deductions ($D.SCC$), which are made by the employer and then transferred to the AFPs and ISAPREs[7] chosen by employees and/or to the treasury office

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[5]A "cadastre" is a public record of the value, extent and ownership of the local real estate as a basis for taxation.

[6]See Letelier (2005) for more details.

[7]Workers choose a private pension fund administrator (administradora de fondos de pensiones, or AFP) and a private health insurance company (institución de salud provisional, or ISAPRE). Those who do not qualify for private health insurance may join the public health system by transferring their health care contribution to the National Treasury Office.

for other required employer payments. A similar situation occurs with the CMF (*D.CMF*) and a number of social subsidies which are administered by the municipality but funded by the central government (*D.OTHER*) (3).

Two additional sources of borrowing should be mentioned. First, a special law was approved in 1982 whereby the central government obtained a loan from the Inter-American Development Bank intended to strengthen municipal management capacity. The funds were then transferred to municipal governments in the form of loans from the central government. This is recorded as internal public debt (*D.IP*). Second, leasing contracts (*D.L*) are in fact a form of long-term liability. For the purposes of this research, total liabilities (*D.TOT*) are the sum of all aforementioned short-term and long-term sources of credit (4) and borrowing (*B*) is their variation over time (5).

$$ARS = D.B + D.NB \tag{2}$$

$$D.NB = D.SSC + D.CMF + D.OTHER \tag{3}$$

$$D.TOT = D.B + D.NB + D.IP + D.LEAS \tag{4}$$

$$B = \Delta D \tag{5}$$

A municipal debt data summary provided in Table 1 shows that approximately 60% of municipal liabilities are of the non-budgeted type (*D.NB*); of which *D.SSC* and *D.CMF* comprise from 23 to 26% of the total. This includes contributions to municipal employees' pension funds, health insurance payments, payroll taxes and other legally required deductions. Although by law AFP and health benefit deductions must be paid between the 29th of the current working month and the 10th of the following one, municipalities often delay making the payment. Another funding source for municipalities is a delay in the payment of the *CMF*, which is a commonly used source of short-term credit. A wide range of small accrued bills from regular municipal suppliers is recorded in the table under the category *D.OTHER*.

In order to put these data into a broader context, it should be kept in mind that the total gross debt of the central government reached US$ 7.094 billion in 2007 which represents

Table 1 Municipal Financial Information (millions US$)	2004	2005	2006	2007
D.NB	**219**	**294**	**290**	**314**
D.SSC	15	14	17	17
D.CMF	42	56	56	55
D.OTHER	162	224	217	242
D.B	**136**	**127**	**142**	**156**
D.IP	86	80	73	69
D.TOT	**442**	**501**	**505**	**539**
D.LEAS	–	109	129	–
A.C	990	1.098	1.187	1.248
A.OTHER	1.140	1.345	1.283	1.437
A.TOT	**2.130**	**2.443**	**2.470**	**2.685**
MREV	**1.158**	**1.195**	**1.293**	**1.309**

Source: SUBDERE and the Government Auditing Office (Contraloría General de la República)

between 1 and 4% of GDP. Since this figure includes neither arrears nor leasing contracts, the comparable municipal variable is internal public debt, which amounts to less than 1% of central government and municipal debt together. Although arrears are not strictly comparable to the central government data, they are indeed significant at the municipal level, as they totaled 36% of municipal revenues (*MREV*) and 38% of current assets (*AC*) in 2007. The sum of all items recorded as debt in municipal accounting should include *D.IP*. Its share of *D.TOT* has been declining, from 19.5% in 2004 to 12.8% in 2007. As for the stock of leasing contracts—not formally accounted for as a liability—this represents an average share of 23.6% of *D.TOT* in the years under consideration.

5 Empirical model

The model to be tested builds upon previous empirical studies on sub-national borrowing. Its general structure is presented in (6) (the sub-indices are omitted). Public debt is made dependent on a set of political variables (*POL*), a number of non-political idiosyncratic variables (*X*) and a set of time dummies (*DT*).

$$DEBT = F(POL, X, DT) + \mu \qquad (6)$$

Regarding *POL*, two approaches are considered. One explores the extent to which ideology influences a municipality's attitude toward borrowing. This is done by defining a variable called *IDEOLOGY*, which results from multiplying municipal government political affiliation (represented by numbers from 1 to 3) by the share of municipal council members who belong to the mayor's coalition (Table 2). The index thus obtained ranges from 1—where the mayor and all council members belong to Juntos Podemos Más (*JPOD*)—to 3 when both the mayor and all council members are identified with the *ALIANZA*. Since such a variable provides a linear representation of a municipal government's position on the left-right axis, it more adequately captures the extent to which ideology predicts fiscal behaviour. Although left-wing political discourse is usually more biased toward expenditure and less focused on balancing the budget, this characteristic is difficult to identify among municipal politicians in Chile. While left-wing parties (*JPOD*) do claim to represent a more socially oriented local government, the message of far-right politicians is very focused on the need to better serve the poor and others in need. Since the policy options are not clearly different from one another, the median voter hypothesis is our null in this case. In other words: party policies are purely opportunistic.

The second approach is based on a set of interaction dummies labeled *CONCERT*, *ALIANZA* and *JPOD* which are accounted for as three separate repressors. Each repressor measures the degree to which a particular mayor belonging to one of these three coalitions can actually enforce its debt-related policies. While the repressor may also be interpreted ideologically, it best captures the specific consequences of one particular coalition being in control. This is potentially relevant in Chile, given the evident similarities between *ALIANZA* and *CONCERT* mayors, and the rather weak ideological commitment of *JPOD* members. The question, then, is whether the specific municipal government condition of being aligned politically with the central government (*CONCERT*), versus a central government opponent (*ALIANZA*, *JPOD*), leads to different borrowing outcomes. Harmony may take the form of more benevolent oversight of local political allies by the central government and/or a better negotiating position for mayors who are politically close to the central government. Other variables in *POL* are *EXP*, which stands for opportunistic behavior based on the belief that

Table 2 Definition of variables

Symbol	Variable	Hypothesis	Expected effect
ICAP	Permanent income per capita. Does not include grants from the central government	Higher income boosts demand for local public goods and improves municipal power relative to creditors	+
IDEOLOGY[*]	$1 \times [\frac{C.JP}{C}] + 2 \times [\frac{C.C}{C}] + 3 \times [\frac{C.A}{C}]$	Conservative coalitions are more likely to abide by the rules	+/−
JPOD	$1 \times [C.JP/C]$ if Juntos Podemos Mas mayor, 0 otherwise		
CONCERT	$1 \times [\frac{C.C}{C}]$ if Concertación mayor, 0 otherwise	Political clientelism may favor Concertación mayors	+
ALIANZA	$1 \times [\frac{C.A}{C}]$ if Alianza mayor, 0 otherwise	Political clientelism may hurt Alianza mayors	+/−
EDUC	Municipality's contribution to education as a share of all resources allocated to this function	Municipalities that contribute more are more likely to have arrears on account of SSC	+
SDESV	Standard deviation of parties being represented in the Municipal Council	Weak government hypotheses	−
EXP	1 if the elected mayor in 2008 does not belong to the ruling coalition from 2004 to 2008. 0 otherwise	Opportunistic use of local debt	+
POP	Municipal population		
MAYOR	$[1/MG] =$ Inverse of mayor's salary grade (*MG*). Ranges from 1 (highest salary) to 6 (lowest salary)	Better qualified mayors are also better paid	+

[*]$1 = JP$ mayor; $2 =$ Concertación mayor; $3 =$ Alianza mayor; $C.JP = JP$ council members; $C.C. =$ Concertación council members; $C.A. =$ Alianza council members; $C =$ Number of council members

an opposing coalition will be elected for the next term, and *SDESV*, which is meant to capture the weak government hypothesis by recording the diversity of parties represented on the municipal council.

As far as non-political variables are concerned, two important ones are municipal GDP per capita and local population (*POP*). First, it will be hypothesized that wealthy municipalities with large populations borrow more, given their stronger bargaining power relative to creditors. Second, larger and richer municipalities will also have grater demands for local public goods, further strengthening their tendency to borrow. Since no measurement of local economic activity is available, municipal revenue per capita (*ICAP*) is used. Given the likelihood of this variable being closely related to local real estate market values, it serves as an adequate proxy of income per capita. On the municipal expenditure side, variable *EDUC* stands for the municipality's share of education spending. Since teacher payrolls are an important source of municipal deficit, it may be expected that a larger *EDU* value will lead to more indebtedness on the part of municipal governments. It should be mentioned, however,

that this is not likely to be relevant when it comes to leasing contracts. Given the long-term orientation of projects funded using leasing contracts, they are not sensitive to short-term (salary-related) considerations. In this case, the key factor is the municipal staff's capacity to develop a leasing-funded project and turn it into a real investment. In order to capture this, the inverse of the mayor's salary grade (*MAYOR*) is used as a proxy. As better-paid mayors are likely to be assisted by more qualified personnel, it can be expected that a higher value of MAYOR will lead to more leasing-based borrowing (*D.LEAS*).[8]

As far as the time dimension (*DT*) is concerned, the political cycle hypothesis predicts that years which are closer to municipal elections are expected to have a positive effect on debt. Once again, this should be more evident for arrears—when compared to leasing—as they provide a flexible way to pass current debt on to the incoming government.

6 Estimation

6.1 Data sample and empirical model

Data were obtained from the Government Auditing Office (GAO)[9] and correspond to the stock of debt held at the end of each year. Available information covers the years from 2004 to 2007. There are three reasons for selecting this period. First, reliable data on debt prior to 2004 are not available. Second, an important change to GAO accounting procedures was introduced in 2008. Third, *D.CMF* became a rather deterministic variable in 2008 (see Sect. 3). Regarding leasing contracts, data were provided by the Ministry of Finance. Since the data so obtained do not permit a thorough breakdown of the debt stock according to the unpaid share of the contract, the average of the entire stock of leasing contracts signed in each of the two available years (2005 and 2006) was used as the endogenous variable. Data on related variables were obtained from SINIM[10] and/or provided directly by the Office of the Undersecretary for Regional Development.

The estimation strategy differs for arrears and leasing. For the former, a four-year panel is estimated. Regressions were run by using the ratio of the stock of debt to the stock of current assets as an endogenous variable. In view of the low Hausman test (Table 3), and the relatively low variation in most explanatory variables over time, a random effect panel was used (7):

$$\left[\frac{D.SSC, CMF_i}{A^C}\right] = \alpha + \beta_1 POL_{it} + \beta_2 ICAP_{it} + \beta_3 X_{it} + \beta_4 D_{it} + \mu_{it}$$
$$i = 1, \ldots, N; \ t = 1, \ldots, T \tag{7}$$

The leasing debt model was estimated under the assumption that *D.LEAS* is not fully random in the sample since municipalities use it once a request is approved by the Ministry of Finance. A sample selection model is then applied by using Heckman's (1979) procedure. The probability of a particular municipality entering into a leasing contract is set up in (8).

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[8]Average mayor's monthly salary in 2009 is US$ 6,471. The standard deviation is 1,040. While only 2% of mayors are paid the highest (grade 1) salary (US$ 8,956), 58.8 % of them are paid the lowest (grade 6) one (US$ 5,726).

[9]Contraloría General de la República.

[10]National Municipal Information System (Sistema Nacional de Información Municipal). See: www.subdere.cl.

Variables in Z include all those grouped in POL (see (5)), plus the inverse of the mayor's salary grade ($MAYOR$) and the ratio $D.CMF/A.C$. On the one hand, a high value for this ratio would be expected to prompt the central government to withhold permission for a leasing contract. On the other hand—as stated above—the mayor's technical expertise is likely to play a very important role in this case. The sample selection regression is shown in (9). $D.LEAS/A.C$ is made dependent on w, which is composed of $ICAP$, POP, $D.CMF/A.C$ and the inverse of the Mills ratio.

$$P\left[\frac{D.LEAS_i}{A.C_i} > 0\right] = z_i'\gamma + \varepsilon_i \tag{8}$$

$$\left[\frac{D.LEAS_i}{A.C_i}\right] = w_i'\alpha + \lambda\frac{\varphi[z_i'\gamma]}{\Phi[z_i'\gamma]} + \nu_i \tag{9}$$

6.2 Results

Table 3 shows the results from (7). Separate regressions are run for $IDEOLOGY$ and the mayor's party affiliation variables ($CONCERT$, $ALIANZA$ and $JPOD$) as optional repressors. From $D.SSC.1$ and $D.CMF.1$ it is evident that ideology does not appear to affect arrears significantly. Despite this, "Concertación" mayors do tend to borrow more ($D.SSC.1$, $D.SSC.2$, $D.CMF.2$ and $D.CMF.3$). This supports the hypothesis that, given the scant ideological commitment of the dominant political parties, there is no clear relationship between political affiliation and fiscal behaviour. Among non-politically related variables, the share of a municipality's contribution to education (EDU) is the only systematically significant variable. Interestingly, although $SDESV$ has the expected effect in all cases, it is significant only for the CMF type of arrears. While this suggests that more politically concentrated councils tend to supervise municipal arrears more closely, this appears to be particularly true for unpaid CMF. Similarly to $SDESV$, population (POP) is a determinant of $D.CMF$ ($PV < 0.03$), albeit not of $D.SSC$ ($PV > 0.23$).

That result clearly is related to the fact that more populous municipalities receive more resources through the CMF. Since they have to contribute to the fund anyway, this makes it more likely that they will use this resource as a short-term source of credit. Regarding time-related variables, one worth mentioning is the expected change in the ruling coalition (EXP). This is again only significant—and correctly signed—for the CMF ($PV < 0.05$). As far as the dynamic behavior of arrears is concerned, two alternative ways of measuring the effect of time are tested. First, $D.SSC.1$, $D.SSC.2$, $D.CMF.1$ and $D.CMF.2$ were estimated with group effects only, but using time dummies for 2005, 2006 and 2007. Results show that only the dummy controlling for the closeness of the next election ($D2007$) is significant. This is especially so for the $D.CMF$ ($PV < 0.05$). Interestingly, the estimated coefficient is consistently larger as we approach 2007, which is the year prior to elections. Second, regressions $D.SSC.3$ and $D.CMF.3$ were estimated with group and time effects simultaneously. The LR time effect test is consistently significant in both cases. The above mentioned results favor the view that opportunistic behaviour does exist in the case of arrears and this is particularly evident when it comes to the $D.CMF$.

An aspect worth mentioning is the fact that political variables ($DESV$, EXP and $D2007$) show more significance when CMF is used as a dependent variable. As stated above, CMF-indebted municipalities used to negotiate this particular type of debt payment directly with the SUBDERE, which represents the interests of the central government. In this context, political clientelism favoring Concertación-affiliated mayors may be more evident for the

Table 3 Debt on social security contributions (SSC) and common municipal fund (CMF). Random effect estimations

	D.SSC.1		D.SSC.2		D.SSC.3		D.CMF.1		D.CMF.2		D.CMF.3	
	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio
ICAP	−0.0003	−1.530	−0.0003	−1.431	−0.0003	−1.433	0.0003	1.189	0.0003	1.292	0.0003	1.272
IDEOLOGY	0.005	0.511					0.017	1.181				
CONCERT			0.045	**2.082	0.045	**2.082			0.049	*1.670	0.049	*1.683
ALIANZA			0.043	1.464	0.043	1.448			0.065	1.610	0.066	*1.646
JPOD			−0.043	−0.259	−0.043	−0.263			−0.014	−0.055	−0.019	−0.074
EDUC	0.001	*1.667	0.001	*1.810	0.001	*1.856	0.002	**2.869	0.002	**2.981	0.002	**2.995
SDESV	−0.010	−0.766	−0.017	−1.318	−0.017	−1.285	−0.031	*−1.694	−0.037	**−2.066	−0.037	**−2.098
POP	−0.1E-06	−1.211	−0.9E-07	−1.203	−1.0E-07	−1.216	0.3E-06	**2.026	0.3E-06	**2.249	0.3E-06	**2.261
EXP	−0.004	−0.01	−0.002	−0.223	0.002	1.216	0.023	*1.790	0.024	**1.997	0.024	**1.998
D2005	0.006	0.673	0.006	0.716			0.015	1.331	0.011	1.089		
D2006	0.011	1.207	0.009	1.129			0.014	1.169	0.010	0.942		
D2007	0.014	*1.640	0.012	1.529			0.026	**2.183	0.021	**2.018		
CONSTANT	0.039	**2.106	0.025	1.487			−0.026	−1.004	−0.030	−1.268	−0.019	−0.756
$LR[\chi^2]$ (1) v/s (3)	**21.35		**30.18		**28.47		**44.36		**54.9		**51.15	
$LR[\chi^2]$ (3) v/s (4)	**1,372		**1,481		**1,480		**1,662		**1,801		**1,802	
$LR[\chi^2]$ (4) v/s (5)					**1,482						**1,805	
Hausman test	0.00		0.00		0.00		0.02		0.00		0.00	

(1) Constant term only, (2) X Variable only, (3) X variables and group effects, (4) X variables, group effects and time effects. * = 10% significant, ** = 5% significant

Table 4 Leasing operations: Heckman procedure

Binomial Probit Model (1)	D.LEAS.1		D.LEAS.2	
	Coef.	t-ratio	Coef.	t-ratio
IDEOLOGY	0.075	0.702		
CONCERT			−0.149	−0.806
ALIANZA			−0.296	−1.194
JTPOD			0.117	0.152
SDESV	−0.049	−0.418	0.036	0.317
MAYOR	0.651	**3.245	0.713	**3.823
D.CMF/A.C	−0.177	−0.703	−0.148	−0.638
CONSTANT	−0.368	**−3.040	−0.269	**−2.491
χ^2 (2)		**15.78		**17.17
H-L(χ^2) (3)		12.43		12.33
McFadden		0.048		0.047
Sample Selection Model	Coef.	t-ratio	Coef.	t-ratio
ICAP	0.002	**2.496	0.002	**2.290
POP	0.6E-06	*1.624	0.5E-06	1.408
D.CMF/A.C	−0.343	−1.183	−0.336	−1.133
λ	0.155	0.801	0.121	0.684
CONSTANT	−0.012	−0.052	0.040	0.175
R^2		0.10		0.08
$\overline{R^2}$		0.06		0.04

(1) Marginal effects, (2) Global significance, (3) Hosmer-Lemeshow test. *10% significant, **5% significant

D.CMF compared to *D.SSC*. While unpaid *SSC* can also be used strategically by the municipal government, this type of debt more directly affects the private interests of municipal employees. Thus, it is more likely to be kept under control by those being affected.

As for leasing operations (Table 4), no politically related variables are significant. However, this result is expected given the existing regulations on leasing operations. Only the inverse of the mayor's salary grade (*MAYOR*) has a clear explanatory power ($PV < 0.05$). It is important to note that the marginal effect of the mayor's salary grade is also quite large (0.71 in *D.LEAS*.2), reinforcing the role of staff qualifications as a key determinant of municipal performance. More qualified personnel do have a higher probability of using more sophisticated financial tools. The sample-bias corrected regression (lower section of the table) reports that income (*ICAP*) is statistically relevant ($PV < 0.03$). On the one hand, municipalities with high revenue per capita are likely to be seen as more reliable debtors by private banks. On the other hand, a wealthier local government will have more demand for local investment. Finally, while *D.CMF/A.C* is correctly signed in all cases, it does not appear to be a significant binding constraint for obtaining a leasing contract.

7 Conclusions

Three policy implications may be drawn from the data. First, the ban on municipal borrowing is largely ineffective. The fact that municipalities actively borrow through arrears and

leasing contracts confirms this. The use of municipal bonds in the context of a more transparent and risk-graded municipal funding system might be an efficient step forward in this regard. As far as short-term borrowing is concerned, limited access to private bank loans appears to be an economically sound solution.

Second, strong evidence exists of political opportunism. Both types of unpaid bills being analyzed are positively sensitive to having mayors in charge who are close to the central government coalition. Interestingly, this result is clear and significant if we control for the mayor's coalition membership, but not when parties' political ideologies are used instead. This is in line with the rather weak ideological commitment of Chilean political parties and supports the hypothesis that mayors who are "well-connected" to the central government are potentially subject to less administrative scrutiny. Further evidence of politically motivated debt-related behavior is twofold. On the one hand, more indebtedness is exhibited close to election years. On the other hand, municipal councils with a high degree of party concentration have a negative effect on unpaid contributions to the *CMF*. This supports the so-called weak government hypothesis, predicting that diversity of political parties in the municipal council leads to a less tightly controlled budget. It is also notable that political variables are generally more significant for arrears related to the *CMF* than for those generated on unpaid *SSC*. This asymmetry is consistent with the existing institutional context. Whereas the *CMF* type of arrears directly affects central government interests, municipal debt on account of *SSC* primarily affects the private interests of municipal staff and has only a secondary effect—through the role of the Government Auditing Office and other public oversight agencies. This evidence suggests a clear need for greater professionalism and fewer political appointments of municipal government personnel. Although Chile has a formal civil service recruitment system, this operates only for high-level positions and does not include myriad staff members who support government work as private consultants but are not subject to formal hiring procedures. More transparent recruitment procedures are needed at the central and the municipal levels.

Finally, it is evident that significant differences in borrowing practices exist among municipalities when controlling for population size and qualified personnel. While significant only for the unpaid *CMF*, size of municipal population appears to have a positive impact on arrears. Investments funded through leasing appear to be insensitive to political factors, as they essentially depend on the mayor's managerial skills. Since such skills may be considered a suitable proxy for the level of professionalism of municipal personnel, it may be concluded that mayor and staff qualifications matter when it comes to local government performance. Unlike arrears, leasing is positively and significantly affected by municipal revenues per capita (as a proxy for local GDP per head) and population. Because the skills required to understand and use such leasing mechanisms are concentrated among only a few municipalities, there is clearly a need for some kind of greater Tiebout (1956) type of inter-municipal government competition. This could be achieved through greater fiscal decentralization, which includes but is not limited to access to borrowing. Increasing the capacity of municipalities to determine tax rates and recruit their staff are other potentially welfare-enhancing options.

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